

REMARKS

Reconsideration and allowance of this application are respectfully requested in view of the above amendment and the discussion below.

Applicants, through their attorney, wish to thank the Examiner for the courtesies extended during the April 1, 2003 personal interview where certain amendments were discussed and, as reflected by the Interview Summary, the argument was presented that the combination of references do not clearly teach the limitation required by the independent claim because the motor of Tadahiro does not function in both directions as would be required for a vehicle which is claimed to lack a forward-reverse switching gear.

In order to appreciate these arguments, a brief discussion of the invention will be presented.

Applicants' invention concerns a hybrid electrical vehicle which uses a permanent magnet dynamo-electric machine. The machine and the engine of the vehicle are connected to a drive shaft without a switching gear required for forward and backward movement. The present invention is directed to making the backward movement torque larger than the torque in the forward movement by using only the dynamo-electric machine without a switching gear. As defined by amended independent claim 5, there is a non-symmetrical shape in the rotor 6 of each of the poles 11 and 12 formed by permanent magnet inserting holes 8, 9 provided within the iron core of the rotor 6. This hole 8, 9 is positioned at a predetermined incline angle (θ) with respect to the circumferential direction. This angle is shown in Figure 10 and is described in the specification at pages 16 and 17. With this predetermined incline angle, the distance of the hole from the

rotational gap 5 is greater in the normal rotation side direction shown as the forward movement than the distance in the reverse rotation side direction. In other words, as shown in Figure 10, the distance from the rotation gap to the hole 8, and the magnet included in the hole 8, increases when moving in the forward direction which is shown in Figure 1 as the counter clockwise direction. With this structure, the ratio between the maximum torque output by the machine when the electric vehicle moves forward and the torque when moving in the reverse direction establishes a ratio claimed in independent claim 5 whereby the torque at the reverse rotation is greater.

Claims 2, 5 and 7-10 have been rejected under 35 U.S.C. §103 as unpatentable over Kawakatsu, U.S. Patent No. 4,335,429 in view of Tadahiro et al., Japanese Patent No. 8-33246 as indicated at item 8 on pages 3-5 of the Office Action. Furthermore, claims 13, 14 and 17 have been rejected under 35 U.S.C. §103 as unpatentable over the above two references and further in view of Fumio, Japanese Patent No. 9-271,151 as indicated at item 9, on page 5 of the Office Action.

In response to this rejection, Applicants have cancelled claims 2, 8, 10 and 14 and amended independent claim 5 to include the limitations of the now cancelled claim 2.

The reference to Kawakatsu has been cited for teaching a hybrid electrical vehicle with an indication being given that it fails to teach the motor of a permanent magnet machine having a stator or a stator core with an indication being given that such motors are well known. The reference to Kawakatsu is also cited for failing to teach the rotor as including a non-symmetrical

configuration about a protruding pole. The reference to Tadahiro has been cited for teaching a motor rotor having a plurality of magnets installed in rectangular openings which are inclined at an angle between 10-45 degrees.

Applicants respectfully traverse this portion of the rejection on the grounds that the reference to Tadahiro is concerned with a rotor which is suitable for one direction rotation and furthermore, the positioning of the magnets 4b at the predetermined angle is opposite to the showing of Figure 10 with respect to its rotation. Even for purposes of argument, accepting the statement of the Examiner for the showing of Tadahiro, there is no indication that one skilled in the art would use such a teaching from a one direction rotation with a hybrid electrical vehicle which functions in both directions in order to increase the torque of the reverse direction. This is especially true when Tadahiro is only concerned with one direction and thus one skilled in the art would not find any teaching which would be helpful in providing a greater torque in a reverse direction, particularly, in a system which has no switching gear between the forward and backward movement as is claimed in independent claim 5.

Dependent claims 13 and 17 contain all the limitations of independent claim 5 and additionally, the reference to Fumio does not have anything which could be addressed to the references to Kawakatsu and Tadahiro to meet the claim limitations of independent claim 5 in its amended form.

The objections to the claims and the rejection of claims 2, 5, 7-10, 13, 14 and 17 under 35 U.S.C. 112 have been addressed by the above amendments to independent claim 5 as well as the cancellation of claims 2, 8, 10 and 14.

The objections to the drawings have been addressed by the addition to Figure 1 and the addition of new Figure 13 as well as a discussion of such figure in the specification which illustrates the arc shape for the permanent magnet and the hole.

Objections to the specification have been addressed by the above amendments to the specification without adding any new matter.

Therefore, in view of the distinguishing features between the claimed invention and the references which features are not shown or disclosed or made obvious by the references or their combinations and in view of the changes to the claim structure, the specification and the drawing to address the objections and the rejections under 35 U.S.C. 112 in the Office Action, Applicants respectfully request that this application containing claims 5, 7, 9, 13 and 17 be allowed and be passed to issue.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #381AS/49196DV).

Respectfully submitted,

Date: April 28, 2003



Gary R. Edwards

Registration No. 31,824

Vincent J. Sunderdick

Registration No. 29,004

CROWELL & MORING, LLP
P.O. Box 14300
Washington, DC 20044-4300
Telephone No.: (202) 624-2500
Facsimile No.: (202) 628-8844